Only the appliances that are not activated, or operating at a partial continuous power level, pose the risk of activating or increasing their load and tripping the circuit breaker.

Once the interrupt switch 20 has closed at step 279 in Figure 5b, power to the appliance is enabled, and the wait period in step 280 is completed, the process step 281 determines whether the supported appliance is operating and applying its highest continuous load. If process step 281 determines there is no load, or the continuous load is less than the highest continuous load for the appliance, the control system follows path 282 to step 271, to again check the GAP levels being transmitted by the generator monitor 10. When the appliance is not at its highest continuous load there is the potential of the appliance activating a higher operational state and increasing its load. To avoid this potential increase at a time when the increase can overload the generator and trip the circuit breaker, the process checks the transmitting GAP levels starting with step 271. If one of the GAP level checks fail in either steps 272 or 275, the control system follows path 274 or 276 to step 286 where the interrupt switch opens, disabling power to the appliance, at which point the monitoring and waiting process repeats as explained above starting with step 294. The monitoring process starting with step 294 is the same as explained above. Alternately, when following path 282 to step 271 if the control system finds sufficient GAP levels in steps 272 and 275 then the process continues to 278 and 279 to keep the switch closed and the appliance enabled. If the supported appliance activates and draws its highest continuous load, the switch remains closed per the process in step 281 along path 283 back to step 280. If the appliance does not activate and apply the highest continuous load, then step 281 directs the process again along path 282 to the GAP level monitoring process starting at step 271.

Collectively, the interrupt switches 20a, 20b, 20c, 20d, . . . work together in a system of artificial intelligence. During the calculated wait period, each interrupt switch 20 monitors the GAP level transmissions generated by the generator monitor 10, while continuing to hold its switch open and power interrupted in steps 287, 288, 291, 293, 295, 296 and back to 287. If the GAP level falls below the requirements during the wait period of step 287, step 288 to path 290 or to path 289 to step 291 to path 292 back to

step 294 the time reference is reset to zero and the interrupt switch 20 starts timing again while continuing to hold the switch open and the appliance disabled. If the GAP level remains below the load applied by the supported appliance, the time reference keeps getting reset to zero and consequently does not increase beyond the time for one cycle. Once the GAP level rises to a point above the requirements of the appliance, the interrupt switch 20 follows path 293 through which the time reference is not reset to zero. Along this path, the time reference increases and becomes a factor in the decision process in step 295. If the GAP level remains larger than the appliance load during, and at the end of, the wait period, then the switch is closed and power is returned to the appliance according to path 297, 271, 272, 273, 275, 277, 278 and 279. If the first, or high, priority appliances turn on and apply their loads when their interrupt switches return power, the GAP levels are reduced accordingly by generator monitor 10, causing lower priority interrupt switches (with larger priority numbers and longer calculated wait periods) to detect lower GAP levels and continue to hold their switches open and their appliances disbled. With every increase in GAP level that passes through the load requirements of an appliance, the interrupt switch 20 or switches 20, reset new wait periods. Given the wait periods are different for all interrupt switches in a system, no two interrupt switches can return power to their appliance at the same time. With each interrupt switch 20 executing its own decision process, the system comprised of the interrupt switches allocates the power from the generator in an orderly fashion without overloading and tripping the generator circuit breaker.

An optional feature is shown in Figure 5b of the interrupt switch 20 Flow diagram. In some implementations, users may want to be notified if appliances have been without power for an extended period of time. For this purpose, the interrupt switch 20 is equipped with the ability to transmit its status to another device in the system, for example the user display 30, of either open switch in step 286 or closed switch in step 278. The interrupt switch 20 transmits either a unique identifier, or its assigned priority, along with its open or closed status. In the case of interrupt switches transmitting via radio waves, the switch can avoid potential Electro Magnetic Interference (EMI) caused by its appliance, by always transmitting when its switch is open. As the flow diagram

shows, the switch transmits an open status in step 286, just after opening the switch, and transmits a closed status in step 278, just before closing the switch. In this scenario, the appliance coupled to the interrupt switch 20 does not have power with which to generate EMI when the interrupt switch 20 is transmitting.

As noted in Figure 5b via path 280, 281, 283, back to 280, the interrupt switch 20 maintains power to an appliance if it is running, and only disables, or interrupts power, if the appliance is not running under path 282, 271,272, etc. of Figure 5b. Given the load of a running appliance is accounted for in the measurement of the momentary load, ML, in step 157 of Figure 3, there is no need to interrupt a load that is accounted for and cannot increase. The exception to this assumption is an appliance that has more than one level of continuous load. Examples of such appliances are refrigerators and air conditioners. Refrigerators draw a low continuous load to power the temperature monitoring system and the internal light when the refrigerator door is opened. The refrigerator draws a much higher continuous load when the compressor motor is running. In the case of an air conditioner, the continuous load is relatively low when just the ventilation fan is running and much higher when the compressor is running. The interrupt switch 20 is therefore designed to recognize the highest continuous load and use this value in its decision making process 281 and in determining if the appliances current state is interruptible. If the continuous load currently applied is the highest of the continuous loads, the interrupt switch 20 does not disable, or interrupt power, if the assigned GAP levels fall to a point where the generator can not support a load equal to that of the appliance. If the current continuous load is lower than the highest measured continuous load, then the interrupt switch 20 interrupts power whenever the GAP levels fall below the start up and continuous load of the appliance. This causes an interrupt switch 20 to interrupt power to a refrigerator drawing just the load of the door open light, should the GAP level fall below the refrigerator start up or continuous load. Also, the air conditioner running just its ventilation fan can be interrupted should the GAP levels fall below the combined fan and compressor surge or continuous loads.